Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.(currently amended). A process for manufacturing a disposable multi-chamber chip, each chamber having low thermal capacity and good thermal isolation from its neighbors, comprising;

providing a mold whose surface includes an array of flat bottomed depressions having a depth no greater than 500 microns, at least one micro-channel being connected to each of said depressions;

placing at least one sheet of a first plastic material, having a first softening temperature, on said mold surface;

on said first plastic material, placing a sheet of a second plastic material that has a second softening temperature that is less than said first softening temperature;

heating all materials to said second softening temperature whereby said first plastic material does not melt;

applying uniform pressure between said plastic sheets and said mold whereby said second plastic material flows, thereby forcing said sheet of first plastic material to conform to said mold surface;

then cooling until said second plastic material has fully hardened; and

separating said plastic materials one from another and then removing the sheet of first plastic material from the mold, thereby forming said disposable multi-chamber chip.

2.(original) The process described in claim 1 wherein said mold is silicon or Ni.

3. (original) The process described in claim 1 wherein said first plastic material is selected from the group consisting of PP. PC. PET.

4. (original) The process described in claim 1 wherein said second plastic material is selected from the group consisting of PC and PMMA>

5. (original) The process described in claim 1 wherein said uniform applied pressure is at least 5KN.

6. (original) The process described in claim 1 wherein said second softening temperature is between about 50 and 100 °C less than said first softening temperature.

7.(currently amended) A process for multi-chamber thermal multiplexing wherein each chamber has low thermal capacity and is thermally isolated from its neighbors, comprising:

providing a mold whose surface includes an array of flat bottomed depressions having a depth no greater than 500 microns, at least one micro-channel being connected to each of said depressions;

placing at least one sheet of a first plastic material, having a first softening temperature, on said mold;

on said first plastic material, placing a sheet of a second plastic material that has a second softening temperature that is less than said first softening temperature;

heating all materials to said second softening temperature whereby said first plastic material does not melt;

applying uniform pressure between said plastic sheets and said mold whereby said second plastic material flows, thereby forcing said sheet of first plastic material to conform to said mold surface;

then cooling until said second plastic material has fully hardened;

separating said plastic materials one from another and then removing the sheet of first plastic material from the mold, thereby forming an array of chambers in a disposable plastic chip having a top surface;

placing said plastic chip on an array of heating blocks whose size and spacing matches that of said multi-chamber array;

using said micro-channels, just filling at least two of said chambers with liquid samples in the form of layers that are ~~less~~ no greater than 500 microns thick;

bonding a cover slip to said top surface so that each liquid sample is completely sealed within its own chamber; and

then using said heating blocks to heat said liquid samples.

8. (original) The process described in claim 7 wherein said mold is silicon or Ni.

9. (original) The process described in claim 7 wherein said first plastic material is selected from the group consisting of PP, PC, and PET.

10. (original) The process described in claim 7 wherein said second plastic material is selected from the group consisting of PC and PMMA.

11. (original) The process described in claim 7 wherein said uniform applied pressure is at least 5KN.

12. (original) The process described in claim 7 wherein said second softening temperature is between about 50 and 100 °C less than said first softening temperature.

13. (original) The process described in claim 7 wherein the step of using said heating blocks to heat said liquid samples further comprises simultaneously heating different liquid samples to different temperatures.

14.(currently amended). A process for multi-chamber thermal multiplexing wherein each chamber has low thermal capacity and is thermally isolated from its neighbors, comprising;

providing a mold whose surface includes a plurality of flat-bottomed depressions having a depth that is not more than 500 microns as well as micro-channels of comparable depth connected to said depressions;

placing at least one sheet of a first plastic material, having a first softening temperature, on said mold;

on said first plastic material, placing a sheet of a second plastic material that has a second softening temperature that is less than said first softening temperature;

heating all materials to said second softening temperature;

applying uniform pressure between said plastic sheets and said mold whereby said second plastic material flows, thereby forcing said sheet of first plastic material to conform to said mold surface;

then cooling until said second plastic material has fully hardened;

separating said plastic materials one from another and then removing the sheet of first plastic material from the mold, thereby forming a plurality of shallow chambers, each connected to at least one micro-channel, in a disposable plastic chip having a top surface;

inserting the disposable plastic chip into cavities singly located within an array of heat sinks whose size and spacing matches that of said multi-chamber array;

filling at least two of said chambers with liquid samples in the form of layers that are less than 500 microns thick;

placing an array of heating blocks, whose size and spacing matches that of said multi-chamber array, in contact with said plastic chip top surface to so that each liquid sample is completely isolated within its own chamber;

applying and then maintaining uniform pressure between said heat sink array and said heating block array, thereby ensuring good heat transfer between them and said liquid samples; and

then using said heating blocks to heat said liquid samples.

15. (original) The process described in claim 14 wherein said mold is silicon or Ni.

16. (original) The process described in claim 14 wherein said first plastic material is selected from the group consisting of PP, PC and PET.

17. (original) The process described in claim 14 wherein said second plastic material is selected from the group consisting of PC and PMMA.

18. (original) The process described in claim 14 wherein said uniform applied pressure is at least 5 KN.

19. (original) The process described in claim 14 wherein said second softening temperature is between about 50 and 100 °C less than said first softening temperature.

20. (original) The process described in claim 14 wherein the step of using said heating blocks to heat said liquid samples further comprises simultaneously heating different liquid samples to different temperatures.

21-37. Canceled